IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with <u>underlining</u> and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please CANCEL claims 5-7, 13-15 and 19 and AMEND claim 17 in accordance with the following:

1.   (CANCELLED)

2.   (CANCELLED)

3.   (CANCELLED)

4.   (PREVIOUSLY PRESENTED) The optical amplifier according to claim 17, wherein the power factor depends upon both the input power and the operating temperature of the EDF.

5.   (CANCELLED)

6.   (CANCELLED)

7.   (CANCELLED)

8.   (PREVIOUSLY PRESENTED) The optical amplifier according to claim 17, wherein:
        the control unit controls an excitation laser diode for the EDF.

9.   (CANCELLED)

10.   (CANCELLED)

                                OK TO ENTER: /D.H./

11.   (CANCELLED)

12.   (CANCELLED)

13.   (CANCELLED)

14.   (CANCELLED)

15.   (CANCELLED)

16.   (CANCELLED)

17.   (CURRENTLY AMENDED) An optical amplifier receiving and amplifying an input optical signal and producing an output optical signal, comprising:

a power detecting unit that detects at least one of an input power of the input optical signal and an output power of the output optical signal and produces a corresponding power detection output;

a temperature detecting unit that detects an operating temperature of an erbium-doped fiber (EDF), a change in the operating temperature causing the gain of the optical amplifier to change, and produces a corresponding temperature detection output; and

a control unit that calculates a power of an amplified spontaneous emission (ASE) based on the power and temperature detection outputs, and adds a power factor that is determined by the power of the ASE to the input power, to maintain the gain of the optical amplifier at a predetermined value~~.~~:

the control unit controls the gain to be

$$gain = \frac{Pout}{Pin + \frac{Poutase}{Gset}(Pin,T)}$$

where Pin represents the input power, Pout represents the output power, Gset represents a set gain, Poutase represents the power of the ASE, and T represents the operating temperature of the EDF.

OK TO ENTER: /D.H./

18.   (PREVIOUSLY PRESENTED) The optical amplifier according to claim 17, wherein:

the power detecting unit detects the input power and the output power, respectively, of the input and output optical signals and produces the corresponding power detection output based on both thereof.

19.   (CANCELLED)

OK TO ENTER: /D.H./